

Jetstream-31 (J31) Flight Report for INTEx-ITCT
Flight 9
16 July 2004

Aqua overpass profiles and near-surface leg, with profiles near Ron Brown

Overview

This was the third J31 flight out of Pease. Goals were:

1. Aqua overpass (1348 EDT, 1748 UT): profiles down & up, with 30-min leg near surface and radiation legs keyed to aerosol layers
2. Ron Brown rendezvous: If clear, profile up with sonde release. If stratus, overfly stratus.

J31, its instruments, and communication with the Ron Brown all performed very well. However, as we descended into the clear area we had found for the Aqua overpass, the surface filled with fog. On return we profiled down and up near the Ron Brown to get J31 meteorological profiles to compare to a special sonde released by the ship.

Flight Path, Timing, and Measurements

Flight path is shown below. Takeoff, planned for 1200 EDT, was delayed by a minor aircraft problem (oxygen masks deployed during cockpit preflight checks). After correcting the problem, we were able to take off at 1302 EDT.

We found a clear spot in the glint-free MODIS area for the Aqua overpass and spiraled down into it. However, as we flew at ~82 m and 1745 UT (3 minutes before Aqua overpass) the water surface below became covered with fog that sometimes extended up to J31's altitude. We parked AATS. We were able to get some AATS AOD measurements at low altitude (see altitude, signal, and cloud-screened AOD at ~17.7 to 17.9 UT in data plot below.) But duration was quite limited. AOD varied considerably in the horizontal. We profiled up to ~6.5 km, but without intermediate radiation legs because fluxes would have been strongly affected by surrounding clouds and spatial variations in surface albedo.

We headed for the Ron Brown at 6.5 km. Ron Brown was under cloud with a clear area nearby. We descended into the clear area with a traffic-control hold at 10 kft (~3 km). When J31 was at 200 ft, Ron Brown released the sonde we had requested. We profiled up to ~3 km and headed home.

We landed at ~1941 UT (1541 EDT).

Instrument Performance

Position and Orientation System (POS): Position accuracy from 6 to <1 m throughout flight. Got one position reject from the auxiliary GPS.

Nav/Met: Data displayed by AATS looked good. No data dropouts. J31 profiles down and up near Ron Brown sonde profile should provide good comparison opportunities.

SSFR: Was always working (see data below). But because of cloud situation, the data's use will primarily be limited to some low level flight periods where sea surface albedos could be derived. Most of the flight we either had cirrus above or fog/clouds beneath the flight level or both. Especially during the climbing to 6.5 km altitude after the Aqua overpass the ocean surface was covered with fog. Do not try to use this part of the flight for radiative transfer calculations with sea surface albedo, it won't work!

AATS: Tracking was good. No evidence of frost. AOD at 1.5 microns looks low. What is the reason for this?

Notes, Insights

Coordination with air-traffic control was improved compared to previous flights. Future coordination is expected to improve further as a result of the meeting with the FAA held just before this flight.

Flying at high altitude saves fuel and time compared to low-altitude legs.

In future flights, pilots need to receive written flight plan (map preferred over words) 1 hour before takeoff. Need go-no go decision 50 minutes before takeoff. Fueling will not start til go decision. Doors close 30 minutes before takeoff.

Areas in the Gulf of Maine that were cirrus-free seemed to be prone to fog, and vice-versa. Is there a physical reason for this anticorrelation?



